CLAIMS

What is claimed is:

1. A lignocellulosic composite board material comprising in admixture, a cured polymeric binder; hollow microspheres contacted at surfaces thereof by the resin; and predominantly lignocellulosic wood pieces, wherein the wood pieces are discontinuously bonded together by the binder.

2. The lignocellulosic composite board material of claim 1, wherein the wood pieces are selected from at least one of wood strands, wood chips, wood wafers, and wood particles.

3. The lignocellulosic composite board material of claim 1, wherein the wood pieces comprise wood strands.

4. The lignocellulosic composite board material of claim 1, wherein the board material has a bending stiffness ranging from about 21,000 to about 30,000 $lb \cdot in^2/ft$.

5. The lignocellulosic composite board material of claim 1, further comprising wood flour, an effective amount of a water repellent agent.

6. The lignocellulosic composite board material of claim 1, wherein the board material has a density reduction of at least a 5% reduction relative to the same board material except omitting the microspheres.

7. The lignocellulosic composite board material of claim 1, wherein the bending strength is increased relative to the board material having the same composition except omitting the microspheres.

8. The lignocellulosic composite board material of claim 1, wherein the lignocellulosic composite is oriented strand board having a void volume of at least 5% not attributable to the microspheres or any foam cells present.

9. The lignocellulosic composite board material of claim 1, wherein the microsphere is selected from the group consisting of hollow glass microspheres, surface treated hollow glass microspheres, hollow ceramic microspheres, hollow polymeric microspheres, and natural perlites, individually or in any combination thereof.

10. The lignocellulosic composite board material of claim 1, wherein the hollow microsphere materials comprise hollow glass microspheres with a density of 0.1 to 0.35 g/cc.

11. The lignocellulosic composite board material of claim 1, wherein the wood pieces comprise southern pine strands.

12. The lignocellulosic composite board material of claim 1, comprising, on a weight basis, about 70 to about 96 wt% dried lignocellulosic material; about 20 to about 0.8% wt% total cured polymeric binder; about 12 to about 0.9 wt% hollow microspheres; and about 3 to about 0.8 wt% additional additives.

13. The lignocellulosic composite board material of claim 1, wherein the additional additives include slack wax and wood

flour.

14. The lignocellulosic composite board material of claim 1, wherein the board material has a density of less than 40 pcf.

15. The lignocellulosic composite board material of claim 1, wherein the board material has a density of less than 38 pcf and a bending strength greater than the board material having the same composition except without the microspheres.

16. A method for making a lignocellulosic composite board material, comprising:

admixing hollow microspheres with a curable polymeric binder to form a binder-coated granular material;

combining lignocellulosic wood pieces with the binder-coated granular material to provide a composite-forming mixture;

consolidating the composite-forming mixture under heat and pressure effective to form a composite board in which the wood pieces are discontinuously bonded with the resin.

17. The method of claim 16, wherein hollow microspheres are blended with wood flour before the admixing with the curable polymeric binder to form the binder-coated granular material.

18. The method of claim 16, wherein the composite board has a bending stiffness in the range of about 21,000 to about 30,000 $lb \cdot in^2/ft$.

19. The method of claim 16, wherein the composite-forming mixture comprises about 70 to about 96 wt% dried lignocellulosic wood pieces; about 20 to about 0.8% wt% total curable binder; about 12 to about 0.9 wt% hollow microspheres; and about 3 to

about 0.8 wt% additional additives.

20. The method of claim 19, wherein the additional additives include slack wax and wood flour.

21. The method of claim 16, wherein the board has a thickness ranging from 0.25 inch to 2 inch with either continuous or multi-opening operation.

22. The method of claim 16, wherein the wood pieces are selected from at least one of wood strands, wood chips, wood wafers, and wood particles.

23. The method of claim 16, wherein the wood pieces comprise wood strands, and wherein the admixing and combining steps are repeated several times to deposit plies on top of each other, prior to the consolidating of the resulting layup into the board.

24. The method of claim 23, wherein the wood strands on top and bottom plies are sprayed with MDI resin.

25. The method of claim 23, wherein the orientation of the wood strands is randomly oriented or directionally oriented with respect to each ply of the layup.

26. The method of claim 23, wherein the orientation of the wood strands is unidirectional with respect to each ply of the layup

27. A board product make by the method of claim 16.

28. A board product make by the method of claim 23.